IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Larosa et al.
For:	Method and Apparatus for Acquisition of a Spread-Spectrum Signal
Serial No.:	09/558,121
Filed:	April 25, 2000
Examiner:	Elallam, A.
Art Unit:	2662

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office, Fax No. (571) 273-8300 on August 22, 2005.

Lawrence Cluff

August 22, 2005
(Date)

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attention: Board of Patent Appeals and Interferences

TRANSMITTAL OF APPEAL BRIEF, and
Petition Requesting a Three Month Extension

The Appeal Brief is being filed in furtherance of a Notice of Appeal, filed via facsimile on March 22, 2005. The present filing date of August 22, 2005, for filing the Appeal Brief is within the permissable two month term for filing the brief, extended an additional three months.

In connection with filing the appeal brief, a total fee in the amount of $1,520 is believed to be due including the $500 fee associated with filing an appeal brief, as provided by C.F.R. §41.20(b)(2), and a $1,020 fee associated with requesting a three month extension, as provided by C.F.R. §1.17(a)(3). The undersigned authorizes the Commissioner and respectfully requests that the fees be charged to deposit account 50-2117 of Motorola, Inc. The

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Commissioner is further authorized to charge any additional fees deemed to be necessary in connection with the proper handling and consideration of the enclosed appeal brief in support of the appeal from the Examiner's final rejection, as well as any fees associated with any underpayments, and/or credit any overpayments to deposit account 50-2117 of Motorola, Inc.

Respectfully submitted,

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APPELLANTS' BRIEF

This brief is being filed in furtherance of the Notice of Appeal, filed via facsimile transmission on March 22, 2005.

Any fees required under C.F.R. §41.20(b)(2), and any required petition for extension of time for filing this brief and fees therefor, are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief contains these items under the following headings, and in the order set forth below (37 C.F.R. § 41.37(c)):

I REAL PARTY IN INTEREST

II RELATED APPEALS AND INTERFERENCES

III STATUS OF CLAIMS

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Motorola, Inc., a Delaware corporation.

II. RELATED APPEALS AND INTERFERENCES

With respect to other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this appeal, there are no such appeals or interferences.

III. STATUS OF CLAIMS

A. Status of all claims in the proceeding

1.	Claims rejected:	13, 14, 18-21, 23, 25-28 and 30
2.	Claims allowed:	1-2, 5-12, 15 and 32-34
3.	Claims withdrawn:	none
4.	Claims objected to:	16, 17, 22, 24, 29, 31
5.	Claims cancelled:	3 and 4

B. Identification of claims being appealed

The claims on appeal are: 13, 14, 16-31

IV. STATUS OF AMENDMENTS

No Amendments have been filed subsequent to the final rejection, dated October 22, 2004.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

A first aspect of the present invention pertains to a method of acquiring a pilot signal in a code division multiple access (CDMA) radiotelephone. The method includes storing (624) a predetermined number of a plurality of samples of a received (622) signal. A pseudo-random noise (PN) sequence is then generated at each of a plurality of different PN offsets. The samples from the same stored predetermined number of samples are then correlated (630) with the PN sequence at each of the plurality of different PN offsets to produce corresponding correlation energies. The correlating is then interrupted (page 32, lines 4-8), when a correlation energy at least equal to a predetermined threshold is produced. A PN sequence timing based upon the PN sequence and a PN offset is then chosen, that produces a full correlation energy at least equal to the predetermined threshold.

A further aspect of the present invention is directed to an apparatus for acquiring a pseudo-random (PN) sequence timing for a code division multiple access (CDMA) radiotelephone (104). The apparatus includes a buffer (230) to store a plurality of samples of a received signal. The apparatus further includes a correlator (116) coupled to the buffer (230) and operable to correlate at least a portion of the same stored samples with a PN sequence at each of a plurality of different PN offsets to produce corresponding correlation energies. The apparatus still further includes a controller (116) coupled to the correlator (116) and operable to interrupt (page 32, lines 4-8) the correlator (116) from correlating portions of the samples with further PN sequences of different PN offsets, when the PN sequence at a particular PN offset produces a correlation energy at least equal to an energy threshold.

A still further aspect of the present invention is directed to a code division multiple access (CDMA) cellular telephone system, which includes at least one base station (102) for transmitting a pilot signal having a particular time alignment, and a cellular telephone

(104) operable to receive representations of the pilot signal, that includes the apparatus for acquiring a pseudo-random (PN) sequence timing for a code division multiple access (CDMA) radiotelephone, noted above.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 13 and 14 have been improperly rejected under 35 U.S.C. 103(a) as being unpatentable over Hutchinson, IV et al. (US Patent No. 5,790,589) in view of Agrawal et al., (US Patent No. 6,363,108).

2. Whether claims 18-21, 23, 25-28 and 30 have been improperly rejected under 35 U.S.C. 103(a) as being unpatentable over Agrawal et al., (US Patent No. 6,363,108) in view of Hulbert, (US Patent No. 6,069,915).

3. Whether claims 16, 17, 22, 24, 29 and 31 have been improperly objected to as being dependent upon a rejected base claim.

VII. ARGUMENTS

A. Rejections under 35 U.S.C. 103

The Federal Circuit has repeatedly emphasized that, with respect to obviousness, the standard for patentability is the statutory standard. The inquiry is whether the claimed subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art. In this regard, see for example, Monarch Knitting Machinery Corp. v. Sulzer Maurat GMBH, 139 F.3d 877, 881, 45 USPQ2d 1977, 1981 (Fed. Cir. 1998).

For purposes of formulating an obviousness type rejection, the Patent and Trademark Office (PTO) has the initial burden of presenting a prima facie case. In re Mayne, 104 F.3d 1339, 1341, 41 USPQ2d 1451 (Fed. Cir. 1997). In order to establish a prima facie case of obviousness, it must be shown that the prior art reference, or references when combined, teach or suggest all of the claim limitations. Pro-Mold and Tool Co. v. Great Lakes Plastics Inc., 75 F.3d 1568, 37 USPQ2d 1626, 1629 (Fed. Cir. 1996), In re Royka, 490 F.2d 981, 180 USPQ 580, 583 (CCPA 1974). Furthermore, the showing of a suggestion, teaching, or motivation to

combine prior teachings "must be clear and particular." In re Dembiczak, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999). These requirements are consistent with the Patent and Trademark Office's own examination guidelines governing the formation of obvious type rejections, see MPEP §2142.

1. Whether claims 13 and 14 have been improperly rejected under 35 U.S.C. 103(a) as being unpatentable over Hutchinson, IV et al. (US Patent No. 5,790,589) in view of Agrawal et al., (US Patent No. 6,363,108).

Relative to claims 13 and 14, the Examiner has rejected the same in view of the combined teachings of Hutchinson, IV et al., '589, and Agrawal et al., '108. However contrary to the Examiner's assertions, the combined teachings of the relied upon references fails to make obvious, the claims 13 and 14. More specifically, in attempting to formulate a proper rejection, the Examiner initially correctly acknowledges that Hutchinson, IV et al., minimally fails to teach or make known storing samples of the received signal to be correlated. However, contrary to the Examiner's assertions, one skilled in the art would not have been motivated by the combined teaching of Hutchinson, IV et al, '589, in view of Agrawal et al., '108, to make known or obvious the respective claim, where one skilled in the art would not have been motivated to combine the respective teachings.

Hutchinson, IV et al. '589, is directed to a system and method for (re)aquiring a pilot channel, which describes a serial correlator searcher, not unlike the serial correlator searcher illustrated in FIG. 2 of Agrawal et al., '108. However, the teachings of Agrawal et al., '108, are not directed to serial correlator searcher, but are alternatively directed to an alternative matched filter approach, where more specifically the searcher taught by Agrawal et al., '108, are taught as adding flexibility to the parallel computation features of a matched filter (col. 4, lines 41-42). Therefore the teachings of Agrawal et al., '108, are not directly relevant to the teachings of Hutchinson, IV et al., '589. Consequently, the teachings would not have motivated one skilled in the art to combine the teachings of the two references as suggested by the Examiner. In absence of a teaching or suggestion to combine, the Examiner has failed to satisfy the requirements of a prima facie case of obviousness, and claims 13 and 14 can not be said to be obvious to one

skilled in the art in view of any alleged combined teachings.

2. Whether claims 18-21, 23, 25-28 and 30 have been improperly rejected under 35 U.S.C. 103(a) as being unpatentable over Agrawal et al., (US Patent No. 6,363,108) in view of Hulbert, (US Patent No. 6,069,915).

Similarly relative to claims 18-21, 23, 25-28 and 30, one skilled in the art would not have been motivated to combine the teachings of the references as suggested by the Examiner to make known the respective claims of the present application. More specifically, the Examiner has attempted to reject claims 18-21, 23, 25-28 and 30 as being unpatentable over Agrawal et al., '108, in view of Hulbert, '915. In formulating the rejection, the Examiner correctly notes that Agrawal et al., '108, minimally fails to teach or suggest interrupting the correlator from correlating portions of the samples with further PN sequences of different PN offsets, when the PN sequence at a particular PN offset produces a correlation energy at least equal to an energy threshold. However, the Examiner incorrectly asserts that Hulbert, '915, makes up for the alleged shortfall in such a way that one skilled in the art would have been motivated to combine the teachings of the two references so as to make obvious the claims of the present invention.

However any asserted alleged combination by the Examiner, appears to ignore an express teaching of Agrawal et al., '108, which alternatively teaches that the "DSP 564 is notified through interrupt when a window search is **complete** and given access to the values stored in the sorting queue" (col. 11, lines 2-4) (emphasis added). Furthermore, the teachings of Agrawal et al., '108, identifies that the sorting queue is used to generate four to eight maximum values for each search window (col. 10, line 66 to col. 11, line 1), which would not generally occur, if the correlating was interrupted in response to a first full correlation energy at least equal to a predetermined threshold. Consequently, the primary reference teaches away from any such alleged teaching, which would motivate one to combine the teachings in such a way so as to make known the claims of the present application, in view of the express teaching to the contrary. Consequently, contrary to the assertions of the Examiner one skilled in the art would not have been motivated to combine the teachings of the relied upon references for purposes of making known or obvious the corresponding claims of the present invention. In absence, of a

teaching to combine, which would overcome the express teaching against combination, the Examiner can not be said to have supported a proper rejection under 35 U.S.C. 103(a).

3. Whether claims 16, 17, 22, 24, 29 and 31 have been improperly objected to as being dependent upon a rejected base claim.

In view of the above analysis, the applicants would assert, that the Examiner has failed to establish that any of the cited references either separately or in combination make known or obvious any of the presently pending claims. Consequently, the base claims upon which claims 16, 17, 22, 24, 29 and 31 are dependent, are in fact improperly rejected, and therefore the present claims should no longer be objectionable. The applicants would respectfully request that the Examiner's decision to finally reject and/or object to any of the presently pending claims be overturned, and that the claims be permitted to proceed to allowance.

Respectfully submitted,

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IX APPENDIX OF CLAIMS

The following is the text of the claims involved in this appeal:

1. In a radiotelephone operable in a code division multiple access (CDMA) system, a method of acquiring a pilot signal, the method comprising:

storing samples of a received signal;

generating, during the step of storing, a PN sequence;

selecting a pseudo-random noise (PN) offset for a PN sequence;

correlating at least a portion of the samples with at least a portion of the PN sequence to produce a correlation energy;

choosing a new PN offset;

comparing the correlation energy to an energy threshold; and

repeating the steps of correlating, choosing, and comparing until any of:

a PN sequence timing is found that produces the correlation energy at least equal to the energy threshold, or

the step of comparing is performed a predetermined number of times; and

wherein during the step of correlating, the PN sequence is re-generated with reference to the PN offset at a faster rate than the step of generating.

2. The method as in claim 1 wherein the step of choosing is responsive to the step of correlating.

3. (canceled)

4. (canceled)

5. The method as in claim 1 further comprising noting, during the step of storing, a position of the PN sequence.

6. The method as in claim 5 wherein the step of selecting is responsive to the step of noting.

7. The method as in claim 5 wherein the new PN offset is chosen with respect to the PN offset selected during the step of selecting.

8. The method as in claim 7 wherein the new PN offset represents an incremented version of the PN offset selected during the step of selecting.

9. A method of activating a radiotelephone operable in a code division multiple access (CDMA) system, the method comprising the steps of:

activating at least a portion of a searcher receiver;

initiating the generation of a pseudo-random noise (PN) sequence;

storing samples of a received signal;

noting, during the step of storing, a position of the PN sequence;

producing, responsive to the step of noting, a reference position of the PN sequence;

re-generating the PN sequence using the reference position;

correlating, during the step of re-generating, at least a portion of the samples with at least a portion of the PN sequence to produce a correlation energy;

incrementing, responsive to the step of re-generating, the reference position;

comparing the correlation energy to an energy threshold; and

repeating the steps of re-generating, correlating, incrementing, and comparing until any of:

a PN sequence timing is found that produces the correlation energy at least equal to the energy threshold, or

the step of comparing is performed a predetermined number of times.

10. The method as in claim 9 wherein the steps of storing, noting, and producing occur at a first rate, and the steps of re-generating, correlating, incrementing, and comparing occur at a second rate, the second rate faster than the first rate.

11. The method as in claim 10 further comprising:

ranking each of the correlation energies as they are produced; and

storing a predetermined number of highest correlation energies and the corresponding reference positions of the PN sequence.

12. The method as in claim 9 further comprising assigning, to at least one demodulation branch of a receiver of the radiotelephone, a PN sequence timing corresponding to the reference position that produces the correlation energy at least equal to the energy threshold.

13. In a code division multiple access (CDMA) radiotelephone, a method of acquiring a pilot signal, the method comprising:

storing a predetermined number of a plurality of samples of a received signal;

generating a pseudo-random noise (PN) sequence at each of a plurality of different PN offsets;

correlating the samples from the same stored predetermined number of samples with the PN sequence at each of the plurality of different PN offsets to produce corresponding correlation energies;

interrupting the correlating when a correlation energy at least equal to a predetermined threshold is produced; and

choosing a PN sequence timing based upon the PN sequence and a PN offset that produces a full correlation energy at least equal to the predetermined threshold.

14. The method as in claim 13 wherein the step of choosing is responsive to the step of interrupting.

15. In a code division multiple access (CDMA) radiotelephone, a method of acquiring a pilot signal, the method comprising:

storing a predetermined number of samples of a received signal;

generating a pseudo-random noise (PN) sequence at each of a plurality of different PN offsets;

correlating the predetermined number of samples with the PN sequence at each of the plurality of different PN offsets to produce corresponding correlation energies, including

a first correlation involving a first portion of the samples and a first portion of the PN sequence, and

a second correlation involving a second portion of the samples and a second portion of the PN sequence,

wherein if during the step of correlating the first correlation produces an intermediate correlation energy less than an intermediate threshold for a particular PN offset, the second correlation at that particular PN offset is not performed;

interrupting the correlating when a correlation energy at least equal to a predetermined threshold is produced; and

choosing a PN sequence timing based upon the PN sequence and a PN offset that produces a full correlation energy at least equal to the predetermined threshold.

16. The method as in claim 14 wherein the step of correlating occurs at a faster rate than the step of storing.

17. The method as in claim 16 further comprising assigning, responsive to the step of choosing, the PN sequence timing to at least one demodulation branch of a receiver of the radiotelephone.

18. An apparatus for acquiring a pseudo-random (PN) sequence timing for a code division multiple access (CDMA) radiotelephone, the apparatus comprising:

a buffer to store a plurality of samples of a received signal;

a correlator coupled to the buffer and operable to correlate at least a portion of the same stored samples with a PN sequence at each of a plurality of different PN offsets to produce corresponding correlation energies; and

a controller coupled to the correlator and operable to interrupt the correlator from correlating portions of the samples with further PN sequences of different PN offsets, when the PN sequence at a particular PN offset produces a correlation energy at least equal to an energy threshold.

19. The apparatus as in claim 18 wherein the controller comprises any of a microprocessor, a digital signal processor (DSP), and logic circuitry.

20. The apparatus as in claim 18 further comprising a memory coupled to the correlator for storing a predetermined number of highest correlation energies and corresponding PN offsets.

21. The apparatus as in claim 20 wherein if after a predetermined number of correlations none of the produced correlation energies at least equal the energy threshold, the controller chooses from the memory a PN offset corresponding to a highest correlation energy.

22. The apparatus as in claim 18 further comprising a latch coupled to an output of the correlator and operable, at each of the plurality of different PN offsets, to latch an intermediate correlation result after correlation over a first number of the samples and operable to latch a second correlation result after correlation over a second number of the samples.

23. The apparatus as in claim 18 further comprising a PN sequence generator coupled to the buffer and the correlator to generate the PN sequence at each of the plurality of different PN offsets.

24. The apparatus as in claim 23 wherein the PN sequence generator comprises a first PN generator and a second PN generator, the first PN generator operable to generate a PN sequence at a first rate to store the samples in the buffer, the second PN generator operable to generate the PN sequence at each of the plurality of different PN offsets at a second rate, the second rate faster than the first rate.

25. A code division multiple access (CDMA) cellular telephone system comprising:

at least one base station for transmitting a pilot signal having a particular time alignment;

a cellular telephone operable to receive representations of the pilot signal, the cellular telephone including:

a buffer to store a plurality of samples of the representations of the pilot signal;

a correlator coupled to the buffer and operable to correlate at least a portion of the same stored samples with a pseudo-random noise (PN) sequence at each of a plurality of different PN offsets to produce corresponding correlation energies; and

a controller coupled to the correlator and operable to interrupt the correlator from correlating portions of the samples with further PN sequences of different PN offsets, when the PN sequence at a particular PN offset produces a correlation energy at least equal to an energy threshold.

26. The CDMA cellular telephone system as in claim 25 wherein the controller comprises any of a microprocessor, a digital signal processor (DSP), and logic circuitry.

27. The CDMA cellular telephone system as in claim 25 further comprising a memory coupled to the correlator for storing a predetermined number of highest correlation energies and corresponding PN offsets.

28. The CDMA cellular telephone system as in claim 27 wherein if after a predetermined number of correlations none of the produced correlation energies at least equal the energy

threshold, the controller chooses from the memory a PN offset corresponding to a highest correlation energy.

29. The CDMA cellular telephone system as in claim 25 further comprising a latch coupled to an output of the correlator and operable, at each of the plurality of different PN offsets, to latch an intermediate correlation result after correlation over a first number of the samples and operable to latch a second correlation result after correlation over a second number of the samples.

30. The CDMA cellular telephone system as in claim 25 further comprising a PN sequence generator coupled to the buffer and the correlator to generate the PN sequence at each of the plurality of different PN offsets.

31. The CDMA cellular telephone system as in claim 30 wherein the PN sequence generator comprises a first PN generator and a second PN generator, the first PN generator operable to generate a PN sequence at a first rate to store the samples in the buffer, the second PN generator operable to generate the PN sequence at each of the plurality of different PN offsets at a second rate, the second rate faster than the first rate.

32. A method of activating a code division multiple access (CDMA) cellular telephone, the method comprising:

turning on the cellular telephone;

activating a searcher receiver;

receiving representations of a pilot signal;

generating a pseudo-random noise (PN) sequence;

storing, during the step of generating, digital samples of the representations of the pilot signal;

re-generating the PN sequence at each of a plurality of PN offsets;

correlating the digital samples with the PN sequence at each of the plurality of PN offsets to produce corresponding single correlation energies;

storing a predetermined number of highest single correlation energies and corresponding PN offsets;

comparing after each correlation each of the single correlation energies to an energy threshold;

suspending the step of correlating responsive to finding a particular PN offset producing a single correlation energy at least equal to the energy threshold and using the particular PN offset as a PN sequence timing of a demodulation branch in a receiver of the cellular telephone; and

if, after the step of correlating is performed a predetermined number of times without producing the single correlation energy at least equal to the energy threshold, then choosing a PN offset corresponding to a highest stored single correlation energy for the PN sequence timing.

33. In a radiotelephone operable in a code division multiple access (CDMA) system, a method of acquiring a pilot signal, the method comprising:

(a) generating a pseudo-random noise (PN) sequence at a first rate;

(b) storing samples of a received signal at the first rate;

(c) noting, during the step of storing, a reference position of the PN sequence;

(d) storing the reference position;

(e) re-generating at a second rate the PN sequence starting from the reference position, the second rate faster than the first rate;

(f) correlating, during the step or re-generating, at least a portion of the samples with at least a portion of the PN sequence to produce a correlation energy;

(g) selecting, responsive to the step of re-generating, a new reference position;

(h) comparing the correlation energy to an energy threshold; and

(i) repeating steps (e) through (h) until any of:

a correlation results in the correlation energy at least equal to the energy threshold, wherein a reference position corresponding to the correlation energy at least equal to the energy threshold is assigned to at least one demodulation branch of a receiver of the radiotelephone, or

the step of comparing is performed a predetermined number of times, wherein a reference position corresponding to a highest correlation energy is assigned to the at least one demodulation branch.

34. In a radiotelephone operable in a code division multiple access (CDMA) telephone system, a receiver circuit for acquiring a pseudo-random noise (PN) sequence timing, the receiver circuit comprising:

a buffer to store samples of representations of at least one pilot signal;

a first PN generator coupled to the buffer to produce a PN sequence at a first rate;

a second PN generator coupled to the buffer to produce the PN sequence at a plurality of PN offsets at a second rate, the second rate faster than the first rate;

a correlator coupled to the buffer and operable to correlate at least a portion of the samples with the PN sequence at each of the plurality of PN offsets to produce a correlation energy for each correlation;

a comparator coupled to the correlator to compare each of the correlation energies to an energy threshold; and

an energy post-processor coupled to the comparator and operable to note a highest correlation energy;

wherein responsive to a particular PN offset resulting in a correlation energy at least equal to an energy threshold, the correlator suspends correlating and the particular PN offset is useful as a PN sequence timing, and

wherein responsive to the correlator performing a predetermined number of correlations and none of the plurality of PN offsets results in the correlation energy at least equal to the energy threshold, a PN offset corresponding to the highest correlation energy is selected as the PN sequence timing.